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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,204	10/29/2003	Ying Zhou	ITL.1024US (P16711)	7312
21906	7590	03/23/2005	EXAMINER	
TROP PRUNER & HU, PC 8554 KATY FREEWAY SUITE 100 HOUSTON, TX 77024			ESTRADA, MICHELLE	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/696,204

Applicant(s)

ZHOU ET AL.

Examiner

Michelle Estrada

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 11-13, 19, 21, 26, 31, 32, 34 and 35 is/are rejected.
- 7) ☒ Claim(s) 5-10, 14-18, 20, 22-25, 27-30 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 11-13, 19, 21, 26, 32, 34 and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by Yao (6,679,996).

With respect to claim 1, Yao discloses soaking a substrate (1) having a dielectric (2) deposited thereon in a salt solution (Col. 7, lines 12-25), said dielectric having a first dielectric constant; and depositing an oxide (3) on said dielectric, said oxide having a second dielectric constant different from the first dielectric constant.

With respect to claim 2, Yao discloses wherein depositing an oxide on said dielectric includes depositing aluminum oxide on said dielectric (Col. 9, lines 17-32), the Examiner clarifies that Yao discloses using a fluoride ion capturing agent added to the aqueous solution to deposit the layer of a corresponding metal oxide or a solid solution thereof, one of these ion capturing agent can be aluminum chloride, therefore aluminum oxide will be formed on the dielectric layer since aluminum oxide is the corresponding metal oxide of aluminum chloride (Col. 9, lines 17-33).

With respect to claim 3, Yao discloses wherein soaking said substrate in said salt solution includes soaking said substrate in a salt solution comprising an aluminum salt (Col. 9, lines 29-32 and 58-61).

With respect to claim 4, Yao discloses wherein soaking said substrate in said salt solution comprising said aluminum salt includes soaking said substrate in a aqueous solution comprising the capturing agent, therefore the salt solution comprises aluminum chloride dissolved in water (Col. 7, lines 15-25).

With respect to claim 11, Yao discloses exposing a dielectric (2) deposited on a substrate to a salt solution; and causing an oxide which is different from said dielectric on said substrate to form on said dielectric (Col. 7, lines 12-20).

With respect to claim 12, Yao discloses including exposing said dielectric on said substrate to an aluminum salt solution (Col. 9, lines 29-31).

With respect to claim 13, Yao discloses including exposing said dielectric on said substrate to an aluminum chloride solution (Col. 9, lines 29-31).

With respect to claim 19, Yao discloses removing said substrate from said salt solution and rinsing (Col. 11, lines 1-8).

With respect to claim 21, Yao discloses depositing a dielectric (2) on a substrate (1) using a first method of deposition; and depositing an oxide (3) on said dielectric by immersing said substrate in a salt solution (Col. 7, lines 12-30), said deposition by immersing different from said first method of deposition.

With respect to claim 26, Yao discloses wherein depositing an oxide on said dielectric includes depositing aluminum oxide on said dielectric by immersing said

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substrate in an aluminum salt solution (Col. 9, lines 17-32), the Examiner clarifies that Yao discloses using a fluoride ion capturing agent added to the aqueous solution to deposit the layer of a corresponding metal oxide or a solid solution thereof, one of these ion capturing agent can be aluminum chloride, therefore aluminum oxide will be formed on the dielectric layer since aluminum oxide is the corresponding metal oxide of aluminum chloride (Col. 9, lines 17-33).

With respect to claim 32, Yao discloses exposing a semiconductor substrate (1) to a salt solution to form at least a portion of a film (3) on the surface of the substrate, the film or portion thereof including aluminum oxide as the primary film material (Col. 9, lines 53-60).

With respect to claim 34, Yao discloses including exposing said semiconductor substrate to an aluminum salt solution (Col. 9, lines 29-32 and 58-61).

With respect to claim 35, Yao discloses including depositing a dielectric (2) that is not aluminum oxide on the substrate (1) before exposing the substrate to the salt solution (Col. 3, lines 20-35).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yao (6,679,996) as applied to claims 1-4, 11-13, 19, 21, 26, 32, 34 and 35 above, and further in view of Ishikawa et al. (2004/0200962).

Yao does not disclose wherein depositing a dielectric on a substrate includes using a chemical vapor deposition technique to deposit said dielectric. Yao's dielectric layer is a polymer, preferably a resist.

Ishikawa et al. teach that resists can be deposited by CVD method (See Paragraph [0065]).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Yao and Ishikawa et al. to enable the dielectric formation step of Yao to be performed according to the teachings of Ishikawa et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed dielectric formation step of Yao and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07.

Allowable Subject Matter

Claims 5-10, 14-18, 20, 22-25, 27-30 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 12/28/04 have been fully considered but they are not persuasive. Applicant argues that Yao fails to specifically disclose depositing an oxide on a dielectric, the oxide and dielectric having different dielectric constants. However, Yao discloses forming a dielectric layer 2 which can be a polymer and depositing an oxide layer (3), which is a metal oxide (Col. 3, lines 25-35 and Col. 5, lines 62-65). These two layers will have different dielectric constants.

Applicant argues that Yao fails to disclose forming a precipitate on a dielectric. However, Yao discloses forming oxide 3 on layer 2, which comprises a dielectric layer.

Applicant argues that is unclear from the Office action where in Yao aluminum chloride is disclosed as a fluoride ion capturing agent, and points out Col. 6, lines 11-45. However, the Examiner believes that Applicant has mistaken references, and is referring to Col. 6, lines 11-45 of Yao (5,830,242). The Examiner based the rejection on the reference of Yao (6,679,996) and pointed to Col. 9, lines 17-33 for the ion capturing agent on the Office Action mailed 10/5/04.

Applicant argues that Yao fails to disclose forming aluminum oxide as the main oxide in a precipitate and on a semiconductor substrate. However, Applicant is directed to Col. 3, lines 20-60 (Yao 6,679,996) where is disclosed that the precipitate is formed in a semiconductor substrate; and to Col. 9, line 53 where is disclosed that the precipitate is mainly aluminum oxide.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is 571-272-1858. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



MEstrada
March 10, 2005



George Fourson
Primary Examiner
Art Unit 2823